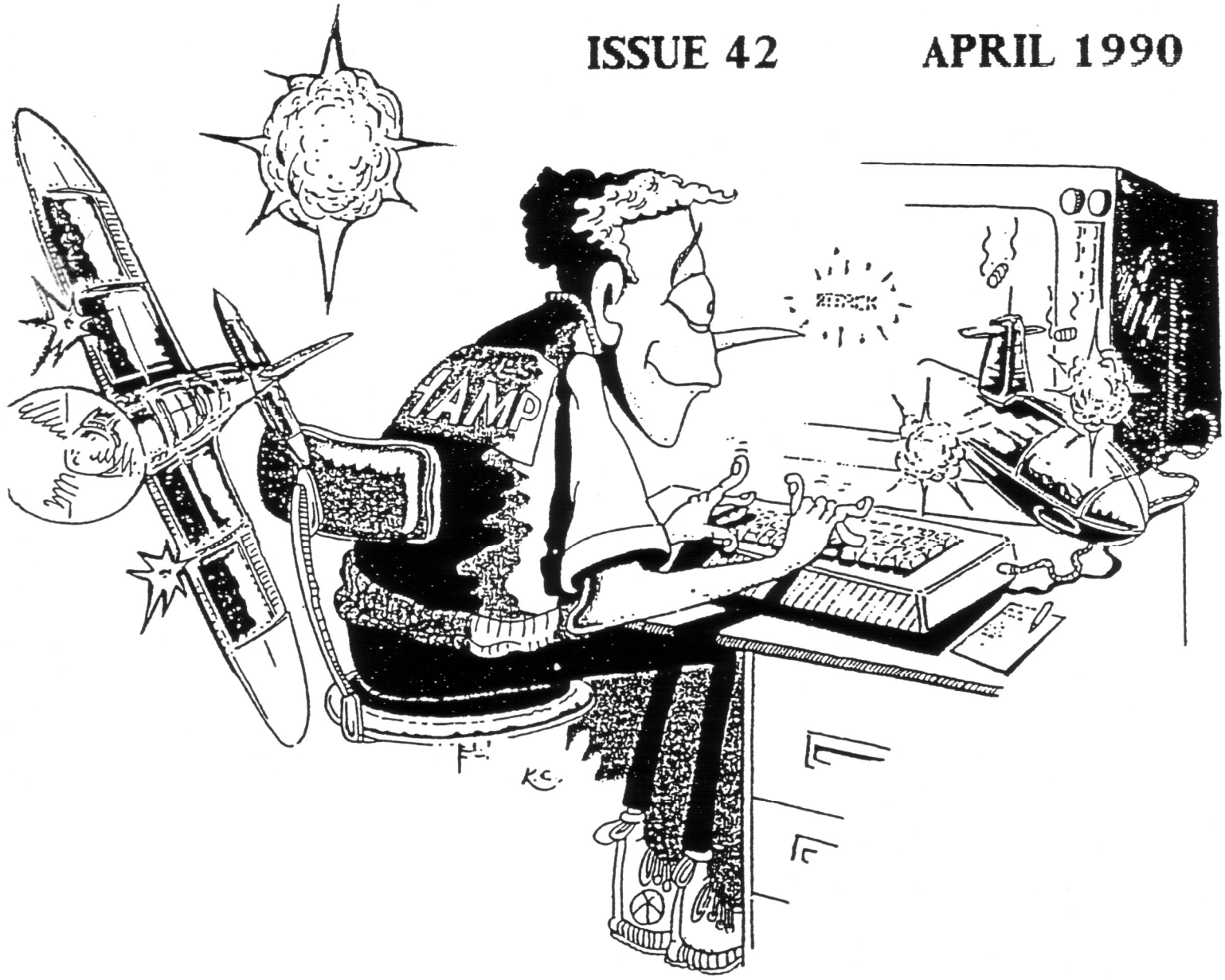
VZ LINK magazine

New Zealand VZ 300/200 Computer users club

ISSUE 42 APRIL 1990



NEWS AND VIEWS

By now you all should of received information on the forthcoming VZ Workshop / Clyb meeting. If you did not receive yours, I will repeat the details again.

Saturday 7 April 1990
Starting at 10.30 am
At the Railways Social Club rooms
Beach Road, City.

If you can't get there until after Lunch then still come. We don't usually finish until 4.00 pm, so it will still be worth while.

UPDATES

It would appear that Gavin Williamson has done a disappearing act in Australia and taken Peter Patterson's money for the Eproms with him. Unfortunately it would also appear that Peter was not the only person to lose money to this rogue. Hopefully he can be tracked down. We will keep you informed.

On the local front, the circuit boards for my AEM 4504 Speech Synthesizer have finally arrived back from Minitech. They seem to have them correct this time.
It has taken them 8 months to redo these boards. I have now started assembling the board and hope to have it finished and up and running within the next couple of weeks.

VISITORS

On Saturday the 24 March I was very honoured to welcome Bob Kitch into my humble, if some what small flat. I was ever so pleased to meet and spend some time with Bob. Also thanks to Peter Patterson and Ken Clarke for attending. We had a really enjoyable morning talking VZ in general. For those that would like to meet Bob sometime, don't worry as Bob will be Visiting New Zealand every two to three Months.
I will organise a Club meeting to coincide with one of these visits.

OF INTEREST

International Correspondence Schools supply a VZ 300 and ram pack with their Home Personal Computer Courses.It cost's $949.00 for the course.

THIS ISSUE

We have a Modification for RTTY units.
We continue our very fine series Micro Magic, this issue we look at Data bases.
We also have a educational program, written by Lou Ellmers.
This program will do all those conversions for you.

NEXT ISSUE

We will have a interesting article from Bits and Bytes magazine on leaning to program.
Also a Narration file creator program written by Steve Dale.
The full listing of Microdata.
A hi score register subroutine written by myself.
Disk drive head park routine by Dave Mitchell.
and last but not least a Index update.(issues 34 to 40)

COMING SOON

Liven-up Animation & Graphics by Bob Kitch.

RTTY MODIFICATION

This item is reprinted with the permission of Mark Harwood, from his VZ User magazine.

The item is written by Mr Stan Stewart of Peakhurst NSW, and involves a simple modification to the VZ GLASS RTTY Module, which allows the module to be 'switched off' while still plugged into the VZ. Not only does this have advantages in terms of convenience, but also allows the user to copy the RTTY program from the EPROM into RAM. Once this has been done, necessary changes can be made (extra functions etc) and the program saved to cassette or disk!.

In order to obtain access to the program, switch the fitted toggle switch to 'off', insert the module, and switch on the VZ. Now switch the module 'on'. The EPROM can now be read using a monitor/disassembler program!.

REMEMBER that the code will need to be 'relocated' (i.e. CALLs & JPs re-aligned) if transferred to RAM.

There is also the possibility that a similar mod can be fitted to the Wordpro Cartridge, allowing it to be copied to RAM and modified.

Thanks to Stan for a handy mod! and Thanks to Mark for consent to use items from his newsletters.

DISABLING THE GLASS RTTY UNIT

Parts required :- 1 Miniature Toggle Switch.
1 4k7 1/4w resistor. (for method 1)

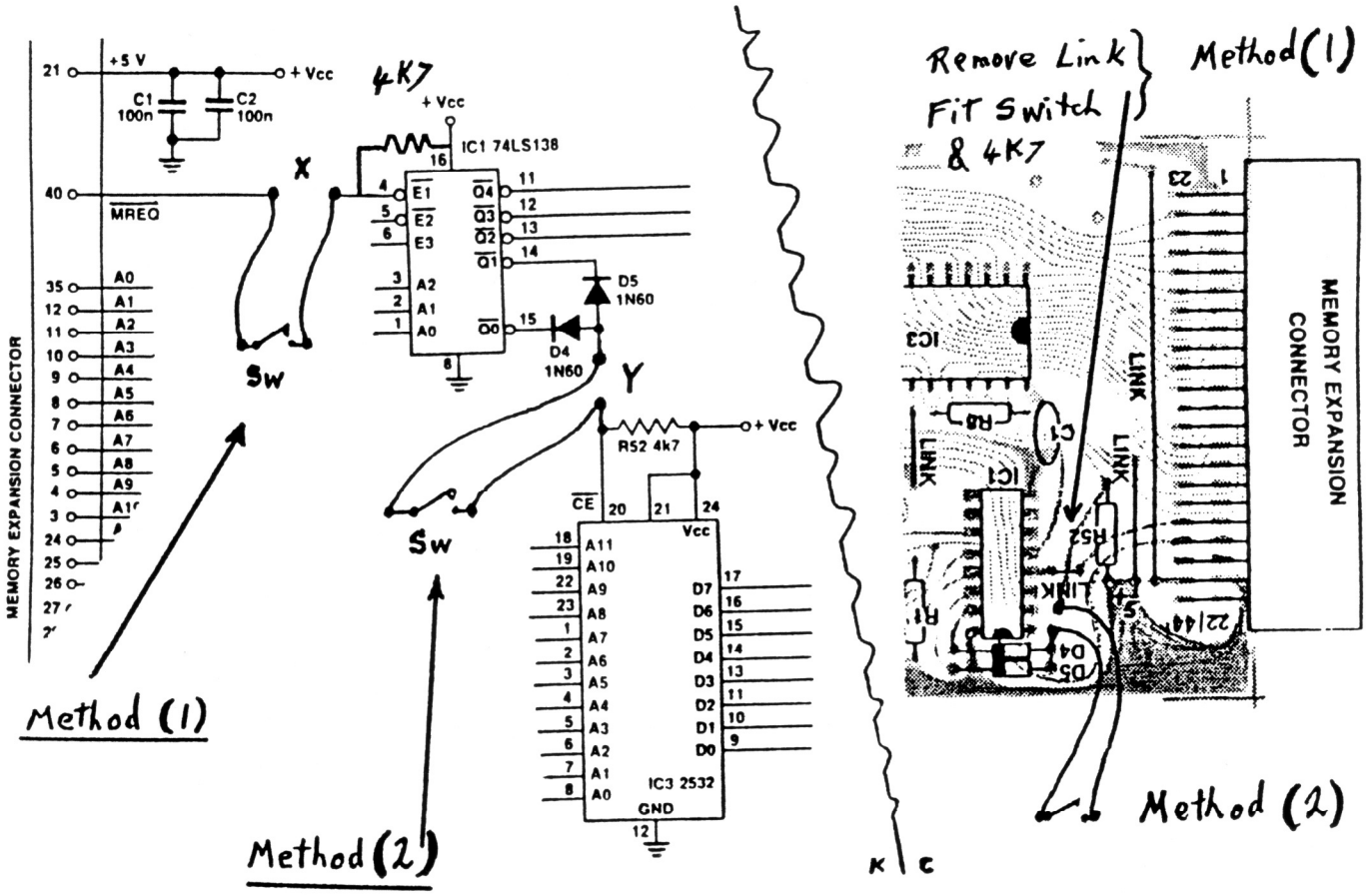
A simple method of switching off the GLASS RTTY UNIT when you wish to use your VZ 200/300 for other things; without having to switch the computer off and unplug the RTTY unit.

There are two methods which can be used to achieve this:-

(1) Disconnect the NOT-MREQ line from Pin 4 OF IC1 (74LS138); This is the easier method, but requires an extra 4k7 resistor.

(2) Disconnecting the enable from Pin 20 of IC3 (2532 ROM).

The diagram shows the section of the circuit in which we are interested. The two methods are illustrated:- (1) cut at (X) and (2) cut at (Y).



METHOD (1).

1. Remove the screws (5) holding the RTTY box together, and remove the PC Boards.

2. Locate the link on the main PC board close to Pin 4 of IC1.

3. Cut the link in the middle, and bend each piece towards the side of the PC board.

4. Cut two lengths of hookup wire each about 15cm long, and solder one end of each wire to the cut links ends.

5. Solder one end of the 4k7 resistor to the cut link end nearest Pin 4 of IC1.

6. Locate resistor R52 (It is near the link you have just cut in 3 above). The end of R52 nearest the cut link is connected to the +5V supply.

7. Solder the free end of the 4k7 resistor to the +5V end of R52.

8. Solder the free ends of the two wires (4 above) to the contacts on the toggle switch.

9. Drill a 6mm hole in the cover of the box (near the back -top-) and insert the switch on the cover.

10. Check your wiring and soldering? and if satisfied, reassemble the unit in the box.

11. Plug the unit into the VZ and check that it works; and that the switch disables the RTTY program and the VZ resets to Basic Ready.

METHOD (2).

1. See 1 in method (1) above.

2. Remove the 3 plastic nuts and separate the two PC boards.

3. Make a cut in the copper track running between the two diodes (D4 and D5) and resistor R52.

4. Rebolt the two PC boards together.

5. Cut two pieces of hookup wire as in 4 in method (1) above.

6. Solder one wire to the anode of D5 (the end nearest the edge connector).

7. Solder the other wire to R52, the end nearest C1.

8. Follow 8 to 11 in method (1) above.

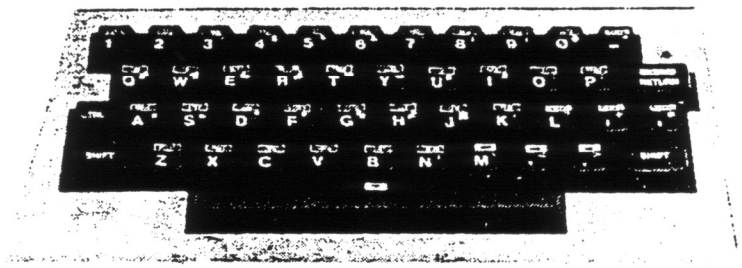
It would help to have a 'RESET' switch as described in the " SUPER II VZ-200 MODIFICATION " article which appeared in ETI magazine July 1986, page 55. This would allow you to return to the RTTY program by switching the RTTY unit on and pushing the reset button.

WARNING

DO NOT plug-in or un-plug any thing from the back of your VZ without first switching your VZ off. You have been warned AGAIN!!.

VeeZed micro magic

BEGINNER'S GUIDE TO BASIC



MICRODATA

The stock in trade of any computer is its memory. Fortunately, although the VeeZed's internal memory is small, we can still store a limitless amount of data on cassettes. We've already seen how words can be tape-filed for future reference. Programs that allow us to file lists (inventories) are known as DATABASE programs.

MICRODATA is a VeeZed Database. Like the pages of a book, your monitor screen will display your choice of 40 pages. Each page has space for 10 entries. That's 400 items of information!!! And that's not all. MICRODATA allows you to manipulate your entries. You can INSERT an item and have the existing entries all move up to make room for it. You can DELETE an entry and the rest will close up to fill the gap. Any number of entries you choose can be rearranged into ALPHABETICAL ORDER, and, of course, you can TAPE-FILE the pages of your choice for future reference. A page, or pages can be printed out on a plotter or a printer. There is even provision for giving the file a name.

```
10  ' ************************
20  ' *    VEEZED    * MICRO *
30  ' * MICRODATA    * MAGIC *
40  ' ************************
```

```
100 CLS:CLEAR10000:DIMZ$(402):COLOR3,1
```

CLEAR10000 to reserve memory space.
CLS to clear the screen.
DIMZ$(402) will allow us to use String Variable Z$ with 402 subscriptions.
COLOR - you can choose your own if you prefer.

```
110 GOSUB940:PRINT@36,"□□MICRODATA□□"

940 FORJ=1TO400:Z$(J)="-":NEXT:FORJ=1TO400STEP10:Z$(J)="*":NEXT
950 RETURN
```

There are 400 places where data may be entered like lines in a notebook. When the program is first loaded all these places are empty. The first loop puts a HYPHEN into every space and the second loop puts an ASTERISK in the first line of each of the 40 pages.

```
120 PRINT@100,"ENTER FILE NAME":PRINT:PRINT"    ";:INPUTF$
130 IFF$=""THENF$="NO NAME"
```

UNDERLINE = INVERSE.
Empty quotes is 4 SPACES.

```
140 CLS:PRINT@67,"MENU  ";F$:PRINT
150 PRINT"    CATALOGUE":PRINT"   PAGE":PRINT"    LOAD"
160 PRINT"    SAVE":PRINT"    HARD COPY":PRINT"    NEW FILE"
170 PRINT"    ALPAHBETICAL SORT":PRINT"    ENTER INDEX LETTER"
```

MAIN MENU

This is the MENU. PRINT means print on the screen and HARD COPY means print on paper. When selecting an item from the MENU, the initial letter is pressed so we have typed these letters in INVERSE. There are 4 SPACES before each one.

```
190 A$=INKEY$:A$=""
200 A$=INKEY$:IFA$=""THEN200
210 IFA$="P'THEN390
220 IFA$="H"THEN520
230 IFA$="A"THEN850
240 IFA$="C"THEN280
250 IFA$="S"THEN1070
260 IFA$="L"THEN1000
270 IFA$="N"THENRUNELSE200
```

A$=INKEY$ is the command that tells the computer to scan the keyboard and make A$ whatever key is being pressed. It has been found that the VeeZed will often run through an INKEY$ command without waiting for a key to be pressed. Line 190 simply ensures that A$ equals nothing so when line 200 is read, the program WILL stop and wait. The ELSE200 in line 270 ensures that if any other key is pressed, the program will go back to 200.

```
280 CLS:PRINT@3,"CATALOGUE  ";F$:PRINT
290 A=1:FORC=1TO40
292 IFZ$(A)="*"THEN310
294 IFZ$(A)="-"THEN310ELSEPRINT"÷PxAGE"C;
300 PRINTZ$(A):GOSUB330
310 A=A+10
320 NEXT:GOSUB340:GOTO400
330 FORT=1TO400:NEXT:SOUND31,1:RETURN
340 A$=INKEY$:A$=""
350 PRINT"END OF CATALOGUE":PRINT"MENU PAGE":SOUND28,2
360 A$=INKEY$:IFA$=""THEN360
370 IFA$="M"THEN140
380 IFA$="P"THEN390ELSE360
```

CATALOGUE

Notice that in lines 292 and 294 we are checking Z$(A). The first time the C it is the first Line of the first Page that is tested to see if it is an asterisk (*) or a hyphen (-). If it is either of these then the program jumps to line 310 whioh increased A by 10, so that when the loop makes C a 2, then Line 20 is checked. By this means we can avoid printing empty pages. Only the pages with entries will be listed. GOSUB330 provides a pause to assist in the reading of the Catalogue, and the words "END OF CATALOGUE" appear along with a mini-menu. This mini-menu enables you to either choose a page or return to the main menu. You can now see that the first entry of each page can be used as a sub-title to be listed on the Catalogue like an INDEX.

The following subroutine selects a page.

```
390 CLS:PRINT@230,"PAGE NUMBER";:INPUTP:IFP<1ORP>40THEN390
400 L=P*10-9:CLS
410 PRINT"PAGE␣"P;"␣␣";F$:PRINT
420 FORI=1TO10:PRINTUSING"###";L;:PRINT"␣";Z$(L):L=L+1
430 NEXT:SOUND25,1
440 PRINT"␣ENTER LINE INSERT":PRINT"␣␣␣␣␣␣␣DELETE PAGE MENU"
450 A$=INKEY$:A$=""
460 A$=INKEY$:IFA$=""THEN460
470 IFA$="L"THEN690
480 IFA$="I"THEN720
490 IFA$="D"THEN780
500 IFA$="P"THEN390
510 IEA$="M"THEN140ELSE460
```

DEBUG AS YOU GO.

SELECT PAGE AND LINE

Line 390 clears the screen and prints "PAGE NUMBER?", the Question Mark being provided by the INPUT. After typing in the required page number it is tested to see if it is less than 1 or greater than 40.
Line 400 calculates the first LINE number from the PAGE number that you have typed in. Variable L contains that number. P will be used to display the page selected.
Line 410 prints the Page number and the file-name
Line 420 is the loop for printing the 10 lines ready for for you to INSERT information.
Line 430 ends the loop with a short sound.
Line 440 is another mini-menu giving you the choice of selecting a LINE (by number), then INSERT, DELETE, another PAGE or the main MENU. The INKEY$ direct your selection to the appropriate sub-routine.

The following subroutine is for printing a HARD COPY.

```
520 PRINT@417,"********COPY TO PRINTER*******"
530 A$=INKEY$:A$=""
540 PRINT@450,"ENTER PAGE(S)  FILE  MENU":SOUND28,1
550 A$INKEY$:IFA$=""THEN550
590 PRINT"␣␣ENTER START PAGE NUMBER";:INPUTP
600 PRINT"␣␣␣␣␣␣␣␣FINAL PAGE NUMBER";:INPUTF:SOUND28,1
610 X=1:LPRINTF$:LPRINT
620 FORI=PTOF:LPRINT"PAGE"I
630 FORJ=XTOX+9:IFZ$(J)="*"THENLPRINT"␣␣PAGE EMPTY":GOTO140
640 LPRINTUSING"##";J;:LPRINT" ";Z$(J)
650 NEXT
660 X=X+10
670 NEXT
680 LPRINT:GOTO140
```

HARD COPY

**** = SHIFT J Graphics. ␣␣␣␣ = Spaces.
If you select H (line 220) the program jumps to this sub-routine. You may then select the page or pages to be LPRINTed or the entire file. If you select PAGE(S) you then enter the the page numbers. If only one page then enter the same number twice.
Line 610 LPRINTs the File name. X is made 1 ready for the loop in line 630.
The loop beginning on line 620 will take care of the Page numbers, and the loop beginning on line 630 LPRINTs the lines but considered the file to be empty when a * is encountered.
LPRINTUSING puts the line numbers in a neat column.
Line 660 increases X by ten to turn the pages.

ENTER TEXT

```
690 PRINT@391,"LINE NUMBER";:INPUTL
700 FORD=417TO447:PRINT@D,CHR$(32):NEXT:SOUND30,1
710 PRINT@417,"TEXT";:INPUTZ$(L):GOTO400
```

Line 690. Look at line 440, it says ENTER LINE INSERT. Line 690 overprints LINE IINSERT to read LINE NUMBER and INPUTL provides the question mark. When the required line number has been entered then line 700 wipes out DELETE PAGE MENU and prints TEXT? Then, when you text has been entered the program goes to line 400 which reprints the page with your text in the appropriate line.

INSERT

```
720 PRINT@391,"LINE NUMBER";:INPUTL
730 FORD=417TO447:PRINT@D,CHR$(32):NEXT:SOUND30,1
740 PRINT@417,"TEXT";:INPUTN$
750 FORJ=400TOLSTEP-1:Z$(J+1)=Z$(J):NEXT
760 Z$(L)=N$
770 GOSUB1600:GOTO400
```

Similar to ENTER TEXT exccept here the text will be INSERTed. Lines 750 and 760 adjusts the line numbers to permit your text to be inserted. Line 770 says GOSUB1600 where all the hyphens and asterisks are replaced. INSERT should be used with care. As everything is moved forward one line number to make space, then there is the risk that any text in line 400 will be lost. Also, if the first line of each page is used as a sub-title to appear on the CATALOGUE, these too will be moved.

DELETE

```
780 PRINT@291,"LINE NUMBER";:INPUTL
790 X=400-L
800 FORJ=1TOX
810 Z$(J)=Z$(J+1)
820 NEXT
830 Z$(400)="-"
840 GOSUB1500:GOTO400
```

This time we DELETE an entry so there is no need for TEXT to be entered, only the text line number to be deleted. GOSUB1500 replaces all those hyphens and asterisks. And, GOTO400 redraws the page with the line deleted.

ALPHABETICAL SORT

```
850 GOSUB960:PRINT@321,"SORT START LINE";:INPUTS:SOUND15,1
860 PRINT@353,"SORT FINAL LINE";:INPUTF:SOUND17,1
870 PRINT@416,"□□□□□ STANDBY SORTING □□□□□":SOUND19,3
880 IFS<1ORS>400ORF<SORF>400THEN970
890 FORJ=STOF:IFZ$(J)="-"THENZ$(J)=" "
900 K=F-S:FORJ=1TOK
910 FORI=FTOSSTEP-1
920 IFZ$(I)<Z$(I-1)THENTP$=Z$(I):Z$(I)=Z$(I-1):Z$(I-1)=TP$
930 NEXT:NEXT:GOTO400
```

GOSUB850 prints MICRODATA, then comes SORT with an INPUT for the starting line, followed by an INSERT for the final line. Line 870 says STANDBY (long sorts can take a little while). Line 890 gets rid of any hyphens that would interfere with the sorting. The sort takes place in lines 900 to 930. Notice how a temporary string variable is used to park information while the swap is being done.

```
960 CLS:PRINT@262,"MICRODATA":RETURN

970 PRINT@416,"*********LINES INCORRECT********":SOUND4,9
980 GOTO400
```

The above are a couple of sub-routines. Line 960 belongs to the GOSUB in line 850. Not an essential sub-routine at all. Lines 970 & 980 is the sub-routine from line 880 which is part of the Alphabetical Sort routine.
The stars ****** are SHIFT J GRAPHICS.

RETRIEVE

```
1000 PRINT@33,"********LOAD FROM TAPE********":COLOR4
1010 PRINT" ********START TAPE NOW********:SOUND28,9:CLS
1020 INPUT#"",F$:PRINTF$:PRINT
1030 FORI=1TO400
1040 INPUT#"",Z$(I):PRINT@448,"          "    (10 spaces)
1045 IFZ$(I)="*"THEN1060
1048 PRINTI;Z$(I)
1050 NEXT
1060 PRINT" **********STOP TAPE**********":SOUND30,9:GOTO140
```

Pretty straight forward. Firstly comes the title LOAD FROM TAPE, then a long sound warning to give you the opportunity to start the tape, and then the File Name is recorded by F$.
The quotes in the loading command are left empty. Unfortunately, the VeeZed will not take a String Variable in here.
The spaces to be printed at 448 are to cover up the word FOUND that appears when retrieving Data from tape.
Line 1045 goes to NEXT if a line begins with *, rejecting empty pages.
Line 1048 prints the line number (I) and the retrieved line.

```
1070 CLS:PRINT@417,"********SAVING TO TAPE********"
1090 A$=INKEY$:A$=""
1100 PRINT@450,"ENTER  FULL FILE OR PART ONLY":SOUND28,1
1110 A$=INKEY$:IFA$=""THEN1110
1120 IFA$="F"THENS=1:F=400:GOTO1180
1130 IFA$="P"THEN1150
1140 IFA$="M"THEN140ELSE1110
1150 PRINT"  ENTER START PAGE NUMBER";:INPUTP
1160 PRINT"        FINAL PAGE NUMBER";:INPUTF
1170 S=P*10-9:F=F*10
1180 CLS:PRINT"**********RECORD NOW**********":SOUND28,9
1190 PRINT#"",F$:PRINTF$
1200 FORI=STOF
1210 PRINT#"",Z$(I)
1212 IFZ$(I)="*"THEN1230
1214 PRINTUSING"##";I;:PRINT" "Z$(I)
1220 NEXT
1230 PRINT"**********STOP  TAPE**********":SOUND30,9:GOTO140
```

RECORD

**** = SHIFT J Graphics. **** = Spaces.
BEWARE! There's no line 1080. Sorry 'bout that.

In response to S in the MENU the program jumps to here. Fisrt, you get the choice of saving either the FULL FILE or PART ONLY. There is also the option of getting back to the Menu should you get to this part of the program by accident or you change your mind.
If you select PART ONLY then you asked to enter the Starting Page number and the Final Page number. Line 1170 converts the PAGE numbers to LINE numbers.
A long sound gives you the opportunity to begin recording. The file name is recorded and then the loop records all the lines of data, and prints them on the screen. If you are recordimg a long file you can go and make a cuppa, the long warning in line 1230 will let you know when it's done. Line 1212 is there to prevent empty pages being recorded.

FINALLY, a couple of sub-routines. They are the subs that replace the HYPHENS and ASTERISKS after they have been disturbed during INSERT and DELETE.

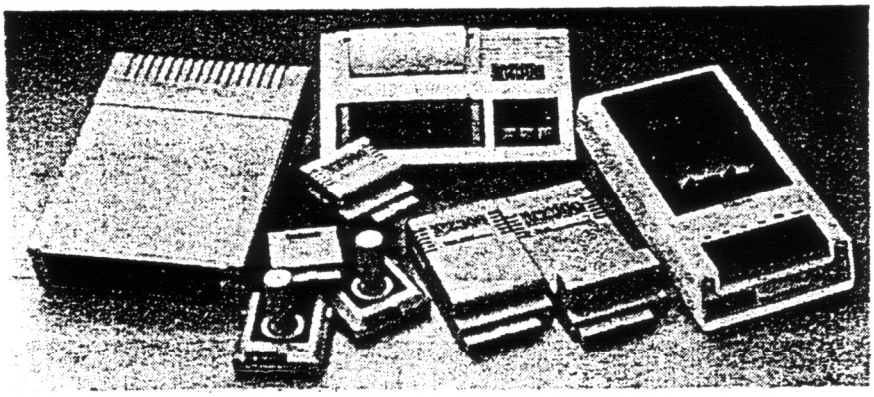
```
1500 G=INT(L/10)*10+10:IFZ$(G)="*"THENZ$(G)="-"
1505 IFZ$(G-9)="-"THENZ$(G)="*"
1510 FORI=GTO400STEP10:IFZ$(I)="*"THENZ$(I)="-"
1520 NEXT:G=G+1
1530 FORI=GTO401STEP10:IFZ$(I)="-"THENZ$(I)="*"
1540 NEXT
1550 RETURN

1600 G=INT(L/10)*10+11
1610 FORI=GTO400STEP10:IFZ$(I)="-"THENZ$(I)="*"
1620 NEXT:G=G+1

1630 FORI=GTO402STEP10:IFZ$(I)="*"THENZ$(I)="-"

1640 NEXT
1650 RETURN
2000 GOTO140
```

If you have a head for Maths, with a bit of Logic thrown in for good measure, you'll be able to see what these lines are doing. Brielfly, they are checking for HYPHENS and ASTERISKS in the <u>WRONG</u> places and changing them to get them into the <u>RIGHT</u> places.



CONVERSION FACTORS

BY LOU ELLMERS

```
10 CLS:PRINT"        CONVERSION FACTORS.":PRINT
20 PRINT"  INCHES TO MILLIMETERS....1"
30 PRINT"  INCHES TO CENTERMETERS   2"
40 PRINT"  FEET TO METERS...........3"
50 PRINT"  YARDS TO METERS..........4"
60 PRINT"  MILES TO KILOMETERS......5"
70 PRINT"  SQ.INCHES TO SQ.CMS......6"
80 PRINT"  SQ.YARDS TO SQ.METERS....7"
90 PRINT"  CUBIC INS TO CUBIC CMS...8"
100 PRINT"  CUBIC FEET TO CUBIC MTS..9"
110 PRINT"  CUBIC YDS TO CUBIC MTRS..10"
120 PRINT"  OUNCES TO GRAMMES........11"
126 PRINT"  ENTER NUMBER OR  'C'  TO        CONTINUE";:INPUTA$
128 IFA$="C" GOTO130ELSE3000
130 PRINT
135 PRINT"  POUNDS TO GRAMMES........12"
140 PRINT"  POUNDS TO KILOGRAMMES....13"
150 PRINT"  CWTS TO KILOGRAMMES......14"
160 PRINT"  TONS TO KILOGRAMMES......15"
170 PRINT"  GALLONS TO LITRES........16"
180 PRINT"  CUBIC INS TO LITRES......17"
190 PRINT"  CU. FT.WATER TO LBS......18"
200 PRINT"  CU. FT.WATER TO GALLS....19"
210 PRINT"  TONS SQ.IN.TO KG. SQ.MM..20"
220 PRINT"  SQ.MTRS / ACRES / SQ YDS.21"
230 PRINT"  KILOWATTS TO H.P.........22"
231 PRINT"  FRACTIONS TO DECIMAL.....23"
240 PRINT"  TO END PROGRAM ENTER Q.
1000 PRINT"  ENTER NUMBER OR  'C'  TO        CONTUINE";:INPUTA$
1010 IFA$="C"THEN GOTO 10ELSE3000
1020 IFA$="Q"THENEND
1030 IFA$=" "THEN GOTO3000
2000 CLS:PRINT@98,"INCHES TO MM.";:INPUTA
2005 PRINT:LETB=A*25.4:PRINT@162,A;" INCHES = "B;"MM."
2010 PRINT@226,"MM. TO INCHES.";:INPUTA:LETB=A*0.03937
2020 PRINT@290, A;"   M.M. = ";B;" INCHES":PRINT:GOTO126
2025 CLS:PRINT@98,"INCHES TO CMS.";:INPUTA
2030 LETB=A*2.54 :PRINT@162,A;" INCHES = "B;"CMS."
2035 PRINT@226,"CMS. TO INCHES.";:INPUTA:LETB=A*0.03937
2040 PRINT@290,A;" CMS. = ";B;" INCHES":PRINT:GOTO126
2050 CLS:PRINT@98,"FEET TO METRES ";:INPUTA
2055 LETB=A*0.3048: PRINT@162,A;" FEET = "B;"MTRS."
2060 PRINT@226,"MTRS TO FEET.";:INPUTA:LETB=A*3.281
2065 PRINT@290,A;" METRS = ";B;" FEET":PRINT:GOTO126
2075 CLS:PRINT@98,"YARDS TO METERS";:INPUTA
2080 PRINT:LETB=A*0.9144:PRINT@162,A;" YARDS = "B;"MTRS."
2085 PRINT@226,"MTRS TO YARDS.";:INPUTA:LETB=A*1.094
2090 PRINT@290,A;" YARDS = ";B;"MTRS.":PRINT:GOTO126
2095 PRINTB;"  METRES = "C;:PRINT" YARDS":GOTO126
2100 CLS:PRINT@98," MILES TO KILOMETERS";:INPUTA
2105 LETB=A*1.609:PRINT@162,A;" MILES = "B;" KMS."
2110 PRINT@226," KMS. TO MILES.";:INPUTA:LETB=A*0.621
2115 PRINT@290,A;" KMS = "B;" MILES":PRINT:GOTO126
2125 CLS:PRINT@98," SQ. INS TO SQ. CMS.";:INPUTA
2130 PRINT:LETB=A*6.452:PRINT@162,A;" SQ INS="B;" SQ CMS"
2135 PRINT@226," SQ CMS TO SQ INS.";:INPUTA:LETB=A*0.155
2140 PRINT@290,A;" SQ CMS =";B;" SQ INS":PRINT:GOTO126
```

```
2150 CLS:PRINT@98," SQ YDS TO SQ MTRS.";:INPUTA
2155 PRINT:LETB=A*0.8361:PRINT@162,A;" SQ YDS = "B;"SQ MTRS."
2160 PRINT@226," SQ MTRS TO SQ YDS.";:INPUTA:LETB=A*1.196
2165 PRINT@290," SQ MTRS = ";B;"SQ YDS":PRINT:GOTO126
2175 CLS:PRINT@98," CUB INS TO CUB CMS.";:INPUTA
2180 PRINT:LETB=A*16.39:PRINT@162,A;" CUB INS = "B;"CUB CMS."
2185 PRINT@226," CUB CMS TO CUB INS.";:INPUTA:LETB=A*0.061
2190 PRINT@290,A;" CUB CMS = ";B;"CUB INS.":PRINT:GOTO126
2200 CLS:PRINT@98," CUB FEET TO CUB MTRS.";:INPUTA
2205 PRINT:LETB=A*0.03:PRINT@162,A;" CUB FT. = "B;"CUB MTRS"
2210 PRINT@226," CUB MTRS TO CUB FT";:INPUTA:LETB=A*35.3
2215 PRINT@290,A;" CUB MTRS = ";B;"CUB FT.":PRINT:GOTO126
2225 CLS:PRINT@98,"CUBIC YDS TO CUBIC MTRS  ";:INPUTA
2230 PRINT:LETB=A*0.76:PRINT@162,A;" CUB YRDS = "B;"CUB MTRS."
2235 PRINT@226,"CUB MTRS TO CUB YDS.";:INPUTA:LETB=A*1.31
2240 PRINT@290,A;" CUB MTRS = ";B;"CUB YDS.":PRINT:GOTO126
2250 CLS:PRINT@98,"OUNCES TO GRAMMS";:INPUTA
2255 PRINT:LETB=A*28.35:PRINT@162,A;" OUNCES = "B;"GRAMMES
2260 PRINT@226,"GRAMMES TO OUNCES";:INPUTA:LETB=A*0.0353
2265 PRINT@290,A;" GRAMMES = ";B;" OUNCES":PRINT:GOTO126
2275 CLS:PRINT@98,"POUNDS TO GRAMMES";:INPUTA
2280 PRINT:LETB=A*453.6:PRINT@162,A;" POUNDS = "B;"GRAMMES"
2285 PRINT@226,"GRAMMES TO POUNDS";:INPUTA:LETB=A*0.002205
2290 PRINT@290,A;" GRAMMES = ";B;"POUNDS":PRINT:GOTO126
2300 CLS:PRINT@98,"POUNDS TO KILOGRAMS";:INPUTA
2305 PRINT:LETB=A*0.4536:PRINT@162,A;" PDS = "B;"KILOS"
2310 PRINT@226,"KILOS TO POUNDS.";:INPUTA:LETB=A*2.2046
2315 PRINT@290,A;" KILOS = ";B"POUNDS":PRINT:GOTO126
2325 CLS:PRINT@98,"CWTS TO KILOS";:INPUTA
2330 PRINT:LETB=A*50.8:PRINT@162,A;" CWTS = "B;"KILOS"
2335 PRINT@226,"KILOS TO CWTS";:INPUTA:LETB=A*0.01968
2340 PRINT@290,A;" KILOS = ";B;"CWTS":PRINT:GOTO126
2350 CLS:PRINT@98,"TONS TO KILOS";:INPUTA
2355 PRINT:LETB=A*1016.0:PRINT@162,A;" TONS = "B;"KILOS"
2360 PRINT@226,"KILOS TO TONS";:INPUTA:LETB=A*0.000984
2365 PRINT@290,A;" KILOS = ";B;"TONS":PRINT:GOTO126
2375 CLS:PRINT@98,"GALLONS TO LITRES";:INPUTA
2380 PRINT:LETB=A*4.546:PRINT@162,A;" GALLONS = "B;"LITRES"
2385 PRINT@226,"LITRES TO GALLONS";:INPUTA:LETB=A*0.22
2390 PRINT@290,A;" LITRES = ";B;"GALLONS":PRINT:GOTO126
2400 CLS:PRINT@98,"CUB INS TO LITRES";:INPUTA
2405 PRINT:LETB=A*0.01639:PRINT@162,A;" CUB INS = "B;"LITRES"
2410 PRINT@226,"LITRES TO CUB INS";:INPUTA:LETB=A*61.03
2415 PRINT@290,A;" LITRES = "B;"CUB INS":PRINT:GOTO126
2425 CLS:PRINT@98,"CUB FEET TO LBS.";:INPUTA
2430 PRINT:LETB=A*62.27:PRINT@162,A;" CUB FEET = "B;"PDS"
2435 PRINT@226,"LBS TO CUB FT.";:INPUTA:LETB=A*0.016
2440 PRINT@290,A;" LBS = "B;"CUB FT.":PRINT:GOTO126
2450 CLS:PRINT@98,"CUB FEET TO GALLONS";:INPUTA
2455 PRINT:LETB=A*6.23:PRINT@162,A;" CUB FT = "B;"GALLS"
2460 PRINT@226,"GALLS TO CUB FT.";:INPUTA:LETB=A*0.16
2465 PRINT@290,A;" GALLS = "B;"CUB FT.":PRINT:GOTO126
2475 CLS:PRINT@98,"TONS P.S.I.TO KG SQ MM.";:INPUTA
2480 PRINT:LETB=A*1.575:PRINT@162,A;" TONS PSI = "B;"KG SQ MM"
2485 PRINT@226,"KG SQ MM TO TONS P.S.I.";:INPUTA:LETB=A*0.635
2490 PRINT@289,A;" KG SQ MM ="B;"TONS P.S.I.":PRINT:GOTO126
2500 CLS:PRINT@98,"SQ METRES TO ACRES";:INPUTA
2505 PRINT:LETB=A*0.000247:PRINT@162,A;"SQ METRES = "B;"ACRES"
2510 PRINT@226,"ACRES TO SQ YARDS";:INPUTA:LETB=A*4840.0
2515 PRINT@290,A;"ACRES = ";B;"SQ YDS":PRINT:GOTO126
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2525 CLS:PRINT@98,"KILOWATTS TO H.P.";:INPUTA
2530 PRINT:LETB=A*1.341:PRINT@162,A;"KILOWATTS = ";B;"H.P."
2535 PRINT@226,"CAUTION! 1=1000 WATTS":PRINT:GOTO126
2550 CLS:PRINT@98,"FRACTIONS TO DECIMAL"
2551 PRINT"  ENTER SMALL NUMBER FIRST THEN   SECOND NUMBER
2552 INPUTA
2553   INPUTB
2555 PRINT:LETC=A/B:PRINT@230,C
2560 PRINT:GOTO126
3000 IFA$="1"THEN2000
3010 IFA$="2"THEN2025
3020 IFA$="3"THEN2050
3030 IFA$="4"THEN2075
3040 IFA$="5"THEN2100
3050 IFA$="6"THEN2125
3060 IFA$="7"THEN2150
3070 IFA$="8"THEN2175
3080 IFA$="9"THEN2200
3090 IFA$="10"THEN2225
3100 IFA$="11"THEN2250
3110 IFA$="12"THEN2275
3120 IFA$="13"THEN2300
3130 IFA$="14"THEN2325
3140 IFA$="15"THEN2350
3150 IFA$="16"THEN2375
3160 IFA$="17"THEN2400
3170 IFA$="18"THEN2425
3180 IFA$="19"THEN2450
3190 IFA$="20"THEN2475
3200 IFA$="21"THEN2500
3210 IFA$="22"THEN2525
3220 IFA$="23"THEN2550
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This program was written by Lou Ellmers.
It will handle all your conversions from Metric to Imperial etc.
It is rather long, so if you have trouble see me for a copy at the workshop.
Try entering it first, it is good practice.

P.O BOX 1972 C.P.O AUCKLAND N.Z

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